

REMARKS

Applicant respectfully requests that the foregoing amendments (which only cancel claims) be entered at least because the amendments reduce the issues for appeal and raise no new issues requiring further search or consideration.

Claims 1-14 and 16 are currently being cancelled without prejudice or disclaimer.

This amendment deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 15 and 17-30 are now pending in this application.

Rejections under 35 U.S.C. §§ 102 and 103

Claims 1-4, 6-16, 17-19 and 21-30 stand rejected under 35 U.S.C. § 102(b) as being anticipated by EP 0782880 to Noda et al. (hereafter “Noda”). Claims 1-2, 15-17 and 30 stand rejected under 35 U.S.C. § 102(b) as being anticipated by EP 0852966 to Ikeda et al. (hereafter “Ikeda”). Claims 5 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Noda in view of U.S. Patent No. 5,164,350 to Abe et al. (hereafter “Abe”). Claims 8-10 and 23-25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ikeda in view of Noda. These rejections are moot with respect to claims 1-14 and 16, which have been cancelled. With respect to the remaining pending claims, Applicant respectfully traverses these rejections for at least the following reasons.

Independent claim 15 is directed to an exhaust gas purifying system and includes an exhaust gas purifying catalyst and a device for controlling combustion in the engine. The exhaust gas purifying catalyst includes a catalytic layer for producing hydrogen (H₂) and reducing NO_x. The device for controlling combustion in the engine is configured as “a device for controlling combustion in the engine to produce exhaust gas, to be brought into contact with said catalytic layer, having a composition meeting a relation [(a concentration of hydrogen / a concentration of total reducing components) ≥ 0.3].” That is, the device for controlling combustion causes the production of exhaust gas having particular characteristics. This represents a direct structural feature of the device for controlling combustion, which feature must

be given patentable weight. This is not a recitation of capability of what the device for controlling combustion may be able to do (as posited in the Office Action), but rather a structural limitation of the device for controlling combustion in an engine. This structural feature cannot be ignored in assessing patentability.

Further, having a device that controls combustion in the engine to produce exhaust gas to be brought into contact with the catalytic layer where the exhaust gas composition meets the recited relation $[(\text{a concentration of hydrogen} / \text{a concentration of total reducing components}) \geq 0.3]$ provides advantages. As disclosed in the specification, when the combustion is controlled to produce an exhaust gas composition that meets the relation as recited in claim 15, the concentration of H_2 in the exhaust gas rises thereby providing even further NO_x reducing performance (see the present specification, page 11, lines 12-15). By contrast, in conventional techniques, any control of combustion creates exhaust gas having exhaust gas having a relation $[(\text{a concentration of hydrogen} / \text{a concentration of total reducing components}) < 0.3]$. Consequently, the rate or concentration of H_2 in the exhaust gas is considerably smaller in the conventional techniques so that it is impossible to effectively use H_2 as reducing component or agent (see the present specification, page 11, lines 15-21).

Neither Noda nor Ikeda disclose or suggest having a device that controls combustion to provide an exhaust gas having the characteristics recited in claim 15, nor the resulting significant advantages in further NO_x reducing performance. The Office Action states at page 4 that “With regards to claim 15, Table 2 (page 10) details an engine which generates an exhaust gas which meets the claimed hydrogen/reducing components ratio.” Noda, however, does not disclose a device for controlling combustion that produces exhaust gas with the particular relation of H_2 and the total reducing components of the exhaust gas as recited in claim 15. In Table 2, Noda discloses a composition of synthetic exhaust gas which is used in an experiment. This is not a disclosure of a device for controlling combustion producing a particular exhaust gas. Moreover, the composition of the synthetic exhaust gas is not one regulated to be supplied to a catalyst in its regular use, and in this sense Noda does not disclose the invention as recited in claim 15.

Moreover, even if the composition of the synthetic exhaust gas of Noda were to be the composition of exhaust gas to be supplied to the catalyst in regular operation, the

composition of exhaust gas as disclosed in Noda does not meet the relation recited in claim 15, where the combustion is controlled to produce exhaust gas, to be brought into contact with the catalytic layer, having a relation [(a concentration of hydrogen / a concentration of total reducing components) ≥ 0.3], as explained below.

As a result of applicant's calculation, in Noda, the ratio (concentration of hydrogen) / (a concentration of total reducing components) becomes (where the total reducing components are CO, H₂ and HC) for Noda:

$$.2 / (0.7 + 0.2 + 0.28) = 0.2 / 1.18 = 0.17 \text{ when } \lambda = 1.0$$

$$.2 / (0.5 + 0.2 + 0.22) = 0.2 / 0.92 = 0.22 \text{ when } \lambda = 1.3$$

$$.33 / (2.0 + 0.33 + 0.45) = 0.33 / 2.78 = 0.12 \text{ when } \lambda = 0.96.$$

Thus, Noda discloses (a concentration of hydrogen / a concentration of total reducing components) < 0.3 in all cases.

The remaining reference of Abe also fails to suggest controlling the combustion to provide the relation of the exhaust gas to be brought into contact with the catalytic layer as recited in claim 15, and thus fails to cure the deficiencies of Noda or Ikeda.

Independent claim 30 is directed to a method that includes the specific step of "supplying exhaust gas to contact said catalytic layer, the exhaust gas having a composition meeting a relation [(a concentration of hydrogen / a concentration of total reducing components) ≥ 0.3]." There is no showing that any of the noted references carry out this step. Thus, claim 30 is likewise patentable over Noda, Ikeda and Abe.

On page 8, the Office Action states that, for device claims 15 and 17-29, the device for controlling combustion in the engine to produce exhaust gas is met by the references (Noda and Ikeda). Applicant respectfully disagrees. As outlined above, claim 15 specifically requires a device for controlling combustion in the engine to produce exhaust gas, to be brought into contact with the catalytic layer, where the exhaust gas has a very specific relation, namely, [(a concentration of hydrogen / a concentration of total reducing components) ≥ 0.3]. Even if Noda and Ikeda were to suggest controlling combustion, neither of these references discloses

controlling combustion so as to produce exhaust gas with the relation as recited in claim 15, nor is this relation inherent. Moreover, as discussed above, the particular relation disclosed in the Table II of Noda cited by the Examiner does not fall within the relation recited in claim 15.

The Office Action on page 8 states with respect to claim 30:

[a]pplicant's calculations are noted. However, as discussed above, the exact ratio is not considered to limit the catalyst as claimed. Also the calculations do not appear to be correct. The number in the ratios are inconsistent. The ratio for $\lambda=1.3$ appears as though it should be equal to 0.3.

With respect to the ratio as recited in claim 30, applicant notes that claim 30 is a method claim, not a claim directed to a catalyst. Thus, the ratio in the step of "supplying exhaust gas to contact said catalytic layer, the exhaust gas having a composition meeting a relation [(a concentration of hydrogen / a concentration of total reducing components) ≥ 0.3]" clearly limits claim 30, and must be considered.

With respect to the calculations, the ratio for $\lambda=1.3$ based on the parameters from Noda still appears to be 0.22, not 0.3 as suggested in the Office Action. If the Patent Office maintains this rejection, applicant respectfully requests the Examiner to provide some detail on how a value of 0.3 is derived based on the Noda parameters for $\lambda=1.3$.

The dependent claims depend from claim 15, and thus are patentable over Noda, Ikeda and Abe for at least the same reasons, as well as for further patentable features recited therein.

For at least the reasons provided above, applicant respectfully requests that the rejection of claims 15 and 17-30 under 35 U.S.C. 102 or 103 be withdrawn.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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